

PROMOTING ACTIVE LEARNING AND INDEPENDENT LEARNING AMONG PRIMARY SCHOOL STUDENTS USING FLIPPED CLASSROOM

Lee Sze Yean

Faculty of Education, University of Malaya (UM), Malaysia, (aprilisy23@gmail.com)

Accepted date: 26-12-2018

Published date: 07-05-2019

To cite this document: Sze Yean, L. (2019). Promoting Active Learning and Independent Learning among Primary School Student Using Flipped Classroom. *International Journal of Education, Psychology and Counseling*, 4(30), 324-341.

Abstract: *With the aspiration from Malaysia government's STEM initiatives, we see the necessities to adapt technology and its tool in teaching and learning has become imminent. However, the process to upgrade the learning experience and efficiency have yet to rise prominently as Malaysian teachers are facing challenges to move from their conventional teaching because they think it is a laborious task. The research I intend to focus in implies the application of flipped learning methodology with the integration of Information and Communications Technology (ICT) in accommodating the needs of different learning styles, abilities, and interests. It aims to break through the negative perceptions on the use of technology and enhance learning by promoting active learning and independent learning among these young students of the 21st Century. The technology integration will replace the traditional teaching and learning methodologies that can help to reform Malaysia's education system to comply to the principles of Education 4.0 and promoting our learners to a competitive edge in the global arena. Using flipped learning, the active and independent learning can be promoted by incorporating and adopting the educational technology into teaching and learning, that revolutionize the way students receive information; encourage active students and parents' participation from pre-lesson till post-evaluation period; as well as engaging their critical thinking and problem-solving skills.*

Keywords: *Flipped Learning, Active Learning, 21st Century Learning, STEM, Education 4.0*

Introduction

This project paper establishes a new pedagogy in teaching and learning among primary school children, age 10 – 12 in Science. This project implies the application of flipped learning methodology with the integration of online app – Edmodo in accommodating the needs of different learning styles, abilities, and interests. It aims to create the learning environment, which includes the e-learning and in-class learning and cultivate positive learning habits among these young students of the 21st Century (Strayer, 2007; Szparagowski R. , 2014).

This active project demonstrates a creative instructional, multi-sensory culminating, collaborative, constructivist teacher's manual which enable an active and independent learning environment in teaching Science. This is based on the scheme published by the masters, the Bergmann and Sams School of Flipped Learning. (FLIP Learning, 2015)

Problem Statement

In this era of globalisation and information technology, the needs for advanced scientific applications are at the peak. STEM education faced many challenges in Malaysia. The teaching and learning process, STEM curriculum and academic results are some of the important factors to build the interest towards STEM from young age. According to Science Outlook 2017, there was a dramatic decline in the performance of *Ujian Penilaian Sekolah Rendah (UPSR)* Science and mathematics in 2016 and 2017. *Penilaian Tahap Tiga (PT3)* in 2014 to 2016 showed an alarming decrease, with less than 25% passed Mathematics and Science with a minimum of C. Statistics showed that less than 30% of PT3 students were eligible for Form Four Science Stream from 2013 – 2017 (Rahman, Science Outlook 2017, 2018). Despite the many initiatives of Ministry of Education (MOE) to improve STEM education as outlined in the Malaysia Education Blueprint 2013-2025, the candidates that enrol for Science Stream for SPM has shown a great decline, causing a possibility of shrinking talent pool of STEM-related human capital in the future (Rahman, Science Outlook 2017, 2018).

Several factors have been identified as reasons of low popularity of STEM subjects among Malaysian students, such as lack of awareness of opportunities in STEM careers, STEM subjects are too difficult, learning science is boring and too theoretical, and lack of encouragement (Rahman, Science Outlook 2017, 2018). Students' academic achievement and long-term participation in STEM courses and careers are very much affected by students' engagement in the subjects (Jennifer A, 2016).

Our educational system for the past decades faced challenges in producing a healthy learning culture among the students. Students in Malaysia rarely are active learners, nor independent in their learning. The exam-centric education system produces teachers, parents and students who focus on achieving good scores and Cumulative Grade Point Average (CGPA) in the examinations. There is too much focus on academic performance, leading to an exam-oriented approach as a measure of intelligence. An exam-oriented education system often comes at the cost of students losing their imaginations and creativities

What is borne from this educational system is a generation who are not capable to think critically on issues. There is worry that our students are unable to cope with the intellectual demands of the rapid-changing world. Such educational system produces students who are narrow-minded and fearful for change. They see, but they do not observe. They read but fail to understand. They score well academically, but not arming themselves with skills and capabilities to face challenges in modern world.

Literature Review

Many have argued about what students should learn, how students should be educated is in fact equally important – designing syllabus, objectives of learning, lessons plan, and mode of instructions. There are several important principles of learning suggested to fit the classroom setting to the 21st Century of learning. (Victoria State Government, 2018)

- i. The learning environment is supportive and productive

- ii. The learning environment promotes independence, interdependence, and self-motivation.
- iii. Students' needs, backgrounds, perspectives, and interests are reflected in the learning program.
- iv. Students are challenged and supported to develop deep levels of cognitive and application.
- v. Assessment practices are an integral part of teaching and learning.
- vi. Learning connects strongly with communities and practice beyond the classroom.

The Need to Change

As such, the myth about education among our people today has shown the need to redesign the educational system and transform the learning and teaching delivery, as well as promoting positive mindset towards learning among all the parties involved, including the policy maker, administration department, schools, teachers, students, and society. Experimental learning, future-ready curriculum, and life-long learning mindset are crucial elements in uplifting our skills and attributes to flourish in the gig economy world. (Mustafa, 2018)

There is a need to change, to reform and to revolutionise the education system to meet our national vision of becoming a developed and modern country. Thus, this project paper has the following objectives:

- i. To promote a student-centered learning and switching the role of teachers to be mentors who provide advices and guidance.
- ii. To nurture students to be independent and active learners who are responsible for their own learning.
- iii. To create efficient learning environment that allows in-depth learning within a limited time frame.
- iv. To motivate the desirability of learning among the students by include inquiry-based learning and projects.
- v. To stimulate long-term interest in learning and adapting science knowledge in life application.
- vi. To enhance the collaboration and active partnership among teachers, parents and students in the learning process.

With the assistance of information technology, the author aims to switch the students' learning methodology from the passive mode learning to active learning via the flipped classroom.

Flipped Classroom for Young Students

The 'flipped classroom' or 'inverted classroom', as its name suggests, is a class which inverts traditional teaching methods, passive learning or direct instructions outside class to enable class time for active learning (Strayer 2007; Tucker, 2012). It creates classroom environment that uses collaborative and constructivist learning (Tucker, 2012) In the flipped classroom, students watch lectures which are assigned and published online (educational technology) by the teachers (instructors) at home at their own pace, communicating with peers and teachers via online discussion. This e-learning at home free up the classroom time for concept engagement and high cognitive learning activities to take place. Flipped classroom creates students who invested in their own learning, desiring to succeed in order to meet expectation of one's peer (Roberts, 2004).

There are two key factors being identified that drive the increased adoption of flipped classroom model (Knewton, 2018):

- i. The poor learning outcomes by the traditional one-size-fits-all model of education often results in limited concept engagement and severe consequences. Flipped classroom which is a student-centered and self-paced learning minimise the learning challenges and motivate students to learn actively and independently.
- ii. The prevalence of online videos and increasing student access to technology have paved the flipped classroom models. For example, Khan Academy has more than 2,400 online video lessons, which covering topics from arithmetic to physics, finance, to history.

Flipped learning has been used for years and spreading across more and more disciplines, especially in higher educational institutes. It seems to a more effective and better respond to the learning needs of students living in today's ever more connected world. In this project, the author is instead promoting and implementing the Flipped Classroom to the younger students from the primary school. It is aimed to produce a win-win situation for both these young students and the teachers.

With this new implementation, I wish to see young students who are active and independent in learning, passionate and curious to learn new things, think creatively and critical to problem-solving, and able to collaborate with the peers in the learning process. Besides knowledge acquisition, the skills and positive learning attitudes that these young students attained will be essential to prepare them for the tomorrow world.

Methodology

The author involves 60 of her upper primary students, 30 males and 30 females, aged 10 to 12, from an enrichment centre to participate in this project. These 60 students are selected based on purposive sampling as they are registered for after school enrichment programme at an urban area in Setia Alam, Selangor who shared similar English proficiency. In order to analyse the effectiveness of flipped classroom on these primary school students, the author compared a flipped classroom with a non-flipped classroom (traditional classroom). The total samples of 60 students are divided into 2 groups – 15 males and 15 females in each group. Group A students are being taught using the traditional classroom approach; whereas Group B students are exposed to the new educational approach – the flipped classroom.

For a fair comparison, a science topic was selected to teach the students from both groups, aiming to develop the understanding on the natural science phenomenon – wind. To test the effectiveness of flipped classroom in promoting active learning and independent learning among these primary school students, the author compares the data collected from the flipped classroom with the non-flipped classroom.

To gather these data, the author started by implementing a Science course which consists of three (3) in-class lessons, for both non-flipped normal classroom (Group A) and the flipped classroom (Group B). Observation data was collected during each class by the author to monitor the participation and effectiveness of the teaching in both the flipped and non-flipped normal classroom. After 3 weeks of implementation of different approach of learning to the different group of students, the author conducted 'Attitude Tests' to survey the students and parents from both Group A and Group B. The survey focuses on aspects such as:

- How long students spent on homework each night?
- How helpful they found the learning approach to their learning?
- How students rate the effectiveness, difficulty, and engagement of the classroom.
- How students rate the interaction and activities involved in the learning?
- How parents rate their involvement and understanding about their children's learning?

In this survey, the students had 5 possible responses to prompt their opinions and thoughts about the learning approach implemented: strongly agree, agree, neither, disagree, or strongly disagree. On top of that, there are three open response questions in the survey, which allow the students to write any comments and express their opinions and suggestions about the class.

Group A: The Non-Flipped Classroom

In the non-flipped normal classroom, there were three in-class lessons to meet the Group A students. Lessons were designed by adopting the normal classroom events such lecture, activities, and other education techniques. Homework and practice exercises about the material covered in class were given after every lesson. Students in the Non-Flipped Classroom will be evaluated based on their homework assigned by the teacher after each lesson, presentation tool prepared (PowerPoint slides or A3 size poster), and the group presentation about the topic in Class 3.

Group B: The Flipped Classroom

For the Group B, to ensure the students do adequate preparation which is necessary for productive class time, the teacher adopts the flipped learning methodology with a teamwork-based learning. An assignment-based model is proposed, in which the students produce work such as writing and problems prior to class. This group of students are all with internet assessment at home. The inverted teaching style in the flipped classroom allowed the teacher to assign homework which was assigned in the online learning platform. Edmodo before the in-class lesson. These included the tasks to watch 5 to 15 minutes online videos and read online article, followed by an online quiz published in the Edmodo. As the samplers are of young primary school students, the teacher assigned short YouTube videos for kids and colourful online articles with simple English vocabulary used.

An online application, 'Edmodo' is used as a platform and classroom tool for communication, collaboration, and coaching. This Edmodo network enables the teachers to share content, publish quizzes, assignments, and manage communication among the students, teachers, and parents. Within the 3 weeks, the syllabus is divided into 5 sessions:

- 2 pre-class sessions (outside class tasks)
- 2 in-class sessions, which is 90 minutes each
- 1 post-class session (outside class task)

One week prior to class, teacher upload reading materials and online YouTube videos through Edmodo. Notifications were sent to the parents and students to notify about the pre-class. Students were free to assess the platform to watch the videos and read the materials assigned by teachers outside the class, anytime of their convenience.

During in-class lessons, students engaged in discussions, hands-on activities (science experiment, preparation of presentation tool, etc), question-answer session (Q&A), problem solving, and group work. Students received productive feedback and advices from the teacher,

who was now playing the role as a coach and mentor. On the first in-class session, the students hands-on to carry out the science experiment ‘Convection Causes Wind’ based on the YouTube video that they have watched before the session. The teacher expanded upon what the students have learned in the video with some review notes. For the homework, students were assigned to watch YouTube videos that demonstrate the ‘Wind Power’ to enhance their knowledge about the topic Wind.

At the end of the course, a post-class task was assigned to the students to assess and evaluate their understanding about the topic and the capability of them to analyse and apply the information they have gained through the lessons. The steps to conduct flipped learning on the science topic – ‘Wind’ is explained as below:

Step 1: Define Content Scope, Learning Objectives, and Instructional Strategies

One week before the first lesson, students and parents received notification about the pre-class tasks, learning objectives and outcomes with links to references via ‘Edmodo’ All web resources and tasks assigned were categorised into different parts. By following each task, students are guided to read and retrieve information from the web resources. This was to promote understanding of different sub-topics. After reading and watching videos, the students answer the quiz uploaded to Edmodo.

Step 2: Instructional Resources to Gain Familiarity with the Content Prior to Class

The pre-class work was set as the scene for the in-class activity. ‘Edmodo’ was used to communicate the new instructional ideas. Online articles and YouTube videos are attached as literature reviews for students’ use outside of class at their own pace and as often as needed. (Refer to Diagram 1 and Diagram 2)

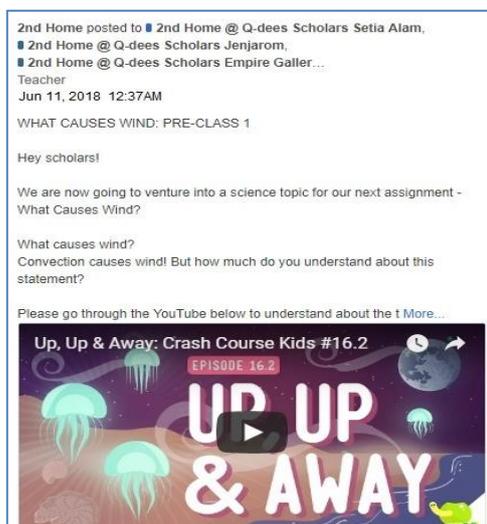


Diagram 1: YouTube Assigned via Edmodo for Pre-Class Session

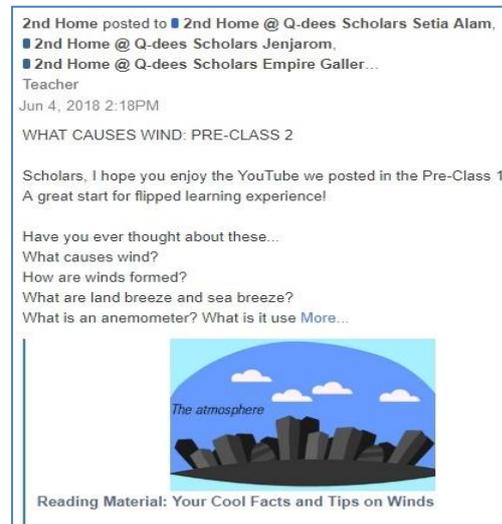


Diagram 2: Online Article Assigned via Edmodo for Pre-Class Session

Step 3: Activities that Motivate Students to Prepare Before Class

Students are graded and awarded with badges based on their results at the pre-class online quiz. These motivate them to be in an active and independent learning mode. Instructor, on the other hand, is able to analyse and evaluate the performance of students that will enable higher

efficiency class preparation. Parents are notified when new tasks are assigned, graded, awarded, and other feedback to keep track of their children's performance.

Step 4: In-Class Activities to Deepen Understanding

During class, students were expected to already have brief understanding about the topic – Wind. The in-class activities focused on brainstorming among group members on the sub-topics and questions given by the instructor. Students exposed to hands-on activities such as conducting science experiment and creating presentation slides. A wrap-up session was conducted at the end of each in-class lesson to allow instructor to summarise the important learning and to brief the students on preparation for the upcoming lesson or task. A timeline work plan helps to ensure the students are on track of their learning.

Step 5: Post-Class Activities that Extend Student Learning

After all the sessions, the teacher guided the students to apply their learning experience from in-class activities to outside of class. The students shall complete an online quiz to recall their learning and to cultivate long-term active and independent learning of science among them. They should also upload the recorded group presentation video to personal YouTube account, and share the video link as the final task. The purposes of these post-class tasks are to ensure the students maximise their learning using Internet facilities and able to apply their knowledge to real-world. Upon online submission, instructor will evaluate and grade their works. Progress reports will be sent to the parents via Edmodo so that they are always in touch with their children's learning.

Step 6: Evaluation or Grading Procedures

Upon completion of each task, students will be graded and awarded accordingly. A final evaluation will be done based on the students' performance and participation at every stage of the lessons, from the pre-class to the post class. It is a quality evaluation as it assesses not only the final performance or knowledge recall but evaluate the active learning and independent learning of the students in this science course, which include their preparation outside the class, participation and contribution during teamwork, and application of skills and knowledge in the real-world.

Results

An analysis was generated based on the teacher's records for the 60 students from both the Group A (Non-Flipped Classroom) and Group B (Flipped Classroom). The purpose is to summarise the effectiveness and efficiency of flipped learning using Edmodo in teaching science. It is to measure how effective is the Flipped Classroom in promoting active learning and independent learning among the Primary School students.

During the Science course, the author did the observation and documented her personal reflection about the Flipped Classroom and Non-Flipped Classroom. The author documented the participations and performance of the students from both the classes. She also recorded what aspects of the Flipped and Non-Flipped Classrooms that she liked and disliked, suggestions for improvement and which approach that she wished to conduct in the coming lessons.

The author analysed and compared the results obtained from the Flipped Classroom and Non-Flipped Classroom. Analysis was also made to assess how the students and parents rated various aspects of the classroom differently. The grades or scores of the students from different approach of teaching were also being evaluated to measure the effectiveness of Flipped

Classroom in promoting active learning and independent learning among the Primary School students in Science.

Besides, questionnaires were being conducted among the students and parents from both the groups to survey their perceptions towards the learning and teaching in the classroom. On top of that, field notes and data collected from classes observation were documented and analysed. Opinions and comments collected from the ground are essential for the future classroom planning and decision making related to the teaching and learning approaches in Primary School.

Below are the results generated based on data collected for both the flipped and non-flipped classrooms throughout the period of Science course:

Number of Students Prepare Before the Class

Table 1 shows the comparison of students’ participation in pre-class preparation for both Group A and Group B. All the students from both the groups (flipped and non-flipped classrooms) were informed earlier about the topic that the teacher was going to teach in the coming lesson. Printed notes for the topic ‘Wind’ were distributed to all the students a week before the lesson. However, the results from the study shows obvious differences in the number of students who did their lesson preparation (briefly going through the materials provided) before the class.

Table 1: Students’ Participation In Pre-Class Preparation						
Teaching Methodology	Group A: 30 Pax (Non-Flipped Classroom)			Group B: 30 Pax (Flipped Classroom)		
	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Boys	2	3	2	10	13	13
Girls	3	4	2	11	14	15
PERCENTAGE	16.7%	23.3%	13.3%	70.0%	90.0%	93.3%
MEAN	17.8%			84.4%		

Table 1 indicates that out of the 30 students in the Non-Flipped Classroom (Group A), only 16.7% of the Group A students (5 students) prepared for their lesson before Class 1, 23.3% of the students (7 students) did their preparation before Class 2, whereas the number of Group A students prepared for their lesson dropped to only 13.3% (4 students) in Class 3. On the other hand, in the Flipped Classroom, obviously more students did their preparation for the lesson before in-class sessions. 70% of the Group B students (21 students) did their preparation for In-Class 1, the percentage increased to 90% (27 students) during In-Class 2, and 93.3% of the students (28 students) were prepared before the In-Class 3.

The results have proven that more students from Group B (Flipped Classroom) were preparing for their lessons before going to the class compared to the students from Group A (Non-Flipped Classroom). Indirectly, it shows that the Flipped Classroom students were more actively participate and independent in the learning compared to the Non-Flipped Classroom.

From the first lesson to the last one, it was noticed that Flipped Classroom experienced a progressive percentage of students who did their pre-class preparation. That may be due to the interesting mode of learning in Flipped Classroom with the advancement of online learning

platform. On top of the printed materials provided, online reading articles and YouTube videos that were assigned as Pre-Class Activities enriched the learning materials and increased the Flipped Classroom students' interest in learning.

Students of different needs were able to assess freely to variety learning materials anytime and anywhere at their convenience. They replayed the videos and reviewed the reading materials as many times as they wished to. That helped them to better solving problems and applied their new knowledge in the classroom. As such, they were motivated and get less frustration with their homework (assignment and task).

Unlike the Non-Flipped Classroom, only very few students prepared for their lessons ahead (Mean = 17.8%) before attending their class. Unaware of syllabus and limited interactions among teacher-student and student-student were few causes of the low percentage of class preparation. These differences show that the initiative, active participation and independence learning among the students were much higher in the Flipped Classroom than the Non-Flipped Classroom.

Number of Students Submit Their Homework On-Time

Besides the statistics about the students' preparation, the teachers also collected the data about the 'On-Time Submission of Homework' among the 2 groups of students. Table 13 shows the comparison of homework submission among the students from the Non-Flipped Classroom and Flipped Classroom.

This aspect is important to show the commitment and attitudes of the students towards their learning. High percentage of students submitting their homework on-time shows high commitment of the students towards their learning. The commitment indicates that they are responsible and self-discipline in learning. These are important attribute to promote active, independent, and life-long learning among our young generation.

Table 2: On-Time Submission Of Homework Among The Students				
Teaching Methodology	Group A: 30 Pax (Non-Flipped Classroom)			Group B: 30 Pax (Flipped Classroom: Quiz)
	Class 1	Class 2	Class 3	Post-Class Task
Boys	6	7	9	14
Girls	6	9	10	15
PERCENTAGE	40.0%	53.3%	63.3%	96.7%
MEAN	52.2%			

Table 2 shows that only about half of the students from Group A (Non-Flipped Classroom) submitted their homework on time (Mean = 52.2%). The Non-Flipped Classroom homework was assigned to the Group A students after every lesson. After Class 1, only 40% of the Group A students submitted their homework, 53.3% submitted Class 2 homework on time, and 63.3% of the students submitted the Class 3 homework. The results show a positive increment, however that was not satisfying comparing to the results achieved in the Flipped Classroom.

Flipped Classroom, there was no ‘traditional homework’ assigned for the students after each lesson. The Flipped Classroom teacher on the other hand assigned some reading materials and videos to be read and watched by the students before the In-Class sessions. However, after the whole Science course, the students of the Flipped Classroom were assigned the Post-Class Tasks, which required the students to do an online quiz, to upload the group presentation video to the individual YouTube account, and to submit (share) the YouTube link to the teacher via Edmodo. Up to 96.7% of the Flipped Classroom students was reported completing their Post-Class Tasks on time.

Time Allocation for Homework Outside Classroom

Table 3 shows the amount of time allocated by the students in their homework outside the classroom.

Table 3: Amount Of Time Allocate For Homework							
Teaching Methodology	Group A: 30 Pax (Non-Flipped Classroom)			Group B: 30 Pax (Flipped Classroom)			
	Class 1	Class 2	Class 3	Pre-Class 1	Pre-Class 2	Pre-Class 3	Post-Class
Boys	25 min	50 min	20 min	15 min	15 min	15 min	15 min
Girls	35 min	60 min	25 min	15 min	15 min	15 min	15 min
MEAN (MIN)	35.8 minutes			15 minutes			

Results show that in average, 35.8 minutes was allocated by these Non-Flipped Classroom students to complete their homework. Whereas the students from the Flipped Classroom stated that they only spent about 15 minutes to completing the Post-Class Tasks. Table 3 indicates that in the Non-Flipped Classroom, time allocated by the students to complete their homework was far more than the Flipped Classroom. This is considered unhealthy as it is far more than what is recommended by the National Education Association that students should receive 10 – 20 minutes of homework per night. (Worland, 2015)

Based on the observation and interviews done and by comparing the 2 group of students, the students from the Non-Flipped Classroom complained that they faced difficulties when doing their homework after class. Some of them did not able to understand well the lessons with the limited time in class. They have limited chance to check with their friends or teacher the content that they did not understand. Condition was worse for students who were late or absent for the class. Even those who wished to learn have limited resources (time and materials) to do so. They were placed at a more passive manner of learning and to wait for the teacher’s instructions and guidance during in-class sessions.

In contrary, students in the Flipped Classroom were more motivated in preparing for each lesson and completing their tasks on-time. Through the Edmodo learning platform, Flipped Classroom students and parents are always being notified when there was any task or assignment given by the teacher. As such, parents were more involved in monitoring and guiding their children in their lessons at school. Even if the students absent or late for classes, or those who did not understand any new concept introduced in the pre-class and in-class, they always have sufficient time and chance to ask questions and get immediate targeted answers,

whether through discussion or Q&A session. The online facility allows them to stay updated with the progress and scores promptly.

Besides, badges that were awarded by the teacher via Edmodo encouraged and motivated the Flipped Classroom students to prepare for their lesson and complete their tasks on-time. They knew that their teacher and parents were always being notified when they have completed their tasks or assignment. Such online learning facility instil the desire of learning among these young students, hence promoted the active and independent learning. Flipped Classroom students initiated to learn more without being pushed or forced by the parents or teacher.

Students' Grades and Score

As mentioned earlier, the students from both the groups who participated in the study are of the similar level of academic results. To further evaluate the effectiveness of Flipped Learning, the author analysed the students' grades and scores in every quiz and group activities assigned to them. Same quizzes and assignments were given to the students in order to have a fair compare to justify a difference between Flipped and Non-Flipped Classroom as indicating that one will produce better grades than the other.

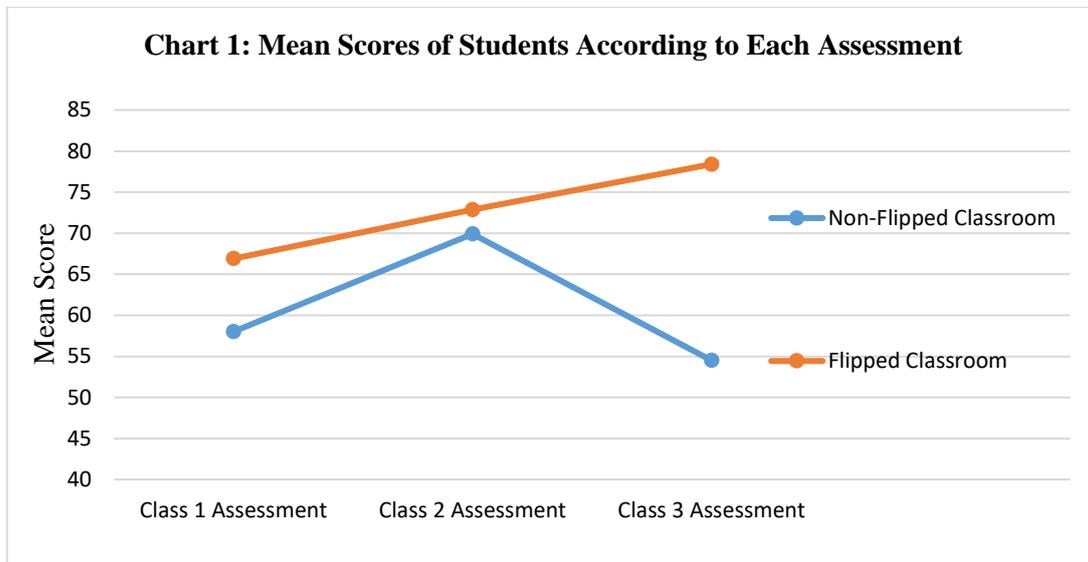
For the Flipped Classroom, quizzes were uploaded to the Edmodo online learning platform about a week before the in-class session. Notifications were sent automatically to the parents and students. Students were required to answer the pre-class online quizzes after reading the online materials and watching the YouTube videos before the due date set by the teacher. Immediate scores and grades were given upon submission of quizzes. The students and parents were again being notified about the scores and grades for each assessment. Badges could be awarded to students who performed well. All these motivated the students to actively engage and score better in their learning. And parents were also glad to be able to actively involve and monitored their children's progress.

On the other hand, teacher in the Non-Flipped Classroom also assigned same quizzes and assignments to the Group A students, but instructions given in the hardcopy printed materials. Students completed their quizzes and assignments after class and passed up the homework the next session of class. They were found scoring lower grades than the Flipped Classroom students. Lesser support from the teacher and peers, insufficient of classroom time to explore the subjects in a deeper manner, and mode of instructions given in Non-Flipped Classroom are some of the factors that caused lower scores among the Group A students.

Table 4: Mean Scores Of Students According To Each Assessment						
Teaching Methodology	Group A: 30 Pax (Non-Flipped Classroom)			Group B: 30 Pax (Flipped Classroom)		
	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Boys	62.5	70.3	51.3	74.3	70.7	80.5
Girls	53.5	69.5%	57.7	59.5	75.0	76.3
SCORES	58.0	69.9	54.5	66.9	72.85	78.4
MEAN	60.8			72.7		

From the results obtained by the students, the teacher calculated the mean results for the assessment assigned for each class, which are recorded in Table 4. Table 4 shows that the mean

score for Group A students from the Non-Flipped Classroom is 60.8, whereas the mean score for Group B Flipped Classroom is 72.7. Results also shows a more constant improvement in scores for Group B students from Class 1 to Class 3, with the mean score 66.9 in the Class 1, 72.85 in Class 2, and 78.4 in Class 3. However, the Non-Flipped Classroom indicates the results which were less consistent. Mean score in Class 1 was 58.0, students scored the best in Class 2 (69.9) but reclined to 54.5 in Class 3. The progress of the students' scores are indicated in Chart 1.



Observation

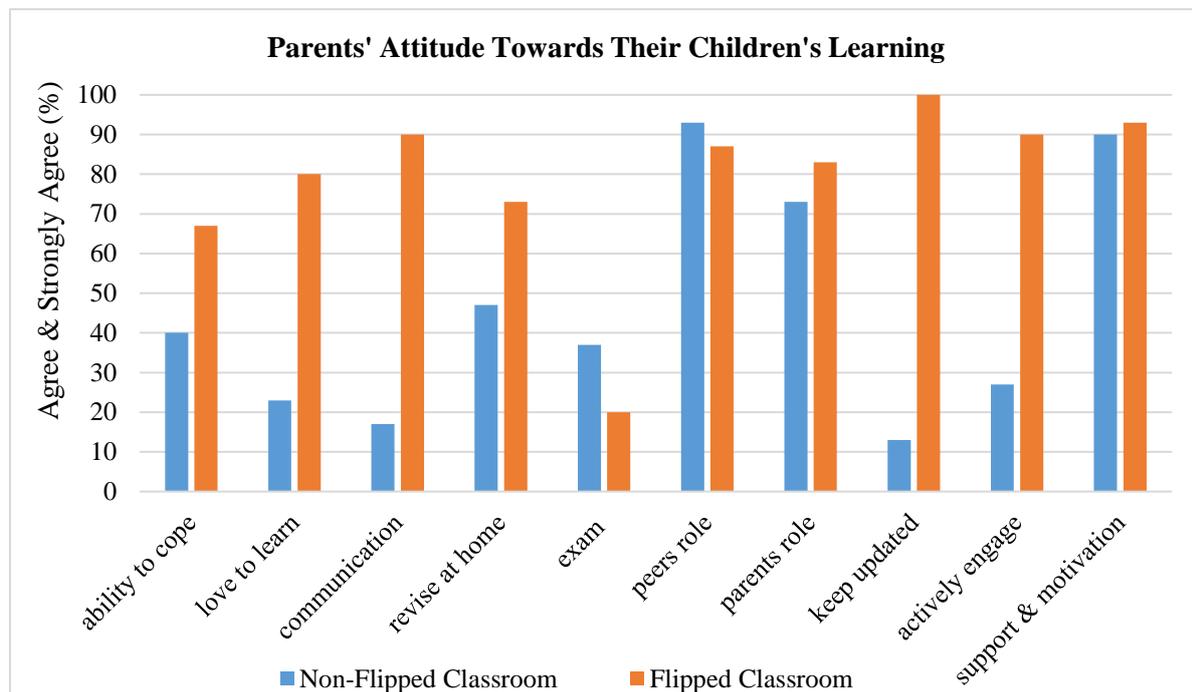
The author has done observation on the second In-Class session for both the Flipped and Non-Flipped Classroom. Even though the topic and materials used are the same for both classes, there are differences in the set-up, class activities and atmosphere of learning in these classrooms. The Non-Flipped Classroom set up in a traditional classroom way where the students are sitting individually at their own table. The class is very quiet with not much of interaction between the teacher and students. Although there are some students who were passing paper messages and chat softly during the lesson, most of the students only talk during answering questions. The teacher was the one doing most talking and teaching. Students were sitting quietly to listen to the lecture.

On the other hand, the Flipped Classroom was full of noise because students were discussing and exchange ideas most of the time. Teacher contrary spoke minimal. She only gave simple instructions and advices when needed. Most of them were well prepared for the lesson and initiative in answering questions. Obviously, the students in Flipped Classroom were the taking charge and participated actively in the learning process. As the teacher did not conduct much teaching, students had more time to do in-depth learning, collaborative learning and brainstorming. Students did not sit still at their places but walking around for materials to complete their group presentation tool. They seem to learn in a happier and more exciting environment.

Attitude Tests

To have more accurate feedback, Attitude Tests were carried out among the parents and students from both the flipped and non-flipped classrooms to access their responses towards

their children’s learning. The bar chart records the number of parents who ‘agree’ and ‘strongly agree’ to the statements in the questionnaire.



From the results, most of the parents from both Flipped and Non-Flipped Classroom agree that peers and parents play important roles in children’s learning. Most of them constantly support and motivate their children in learning too. However, when asked about their views on the children’s behaviors and performances, the results from these two different groups of parents are vary. Majority of Flipped Classroom parents (Group B) stated that their children are happy and motivated in their learning. As such, 73% of the Flipped Classroom parents show that their children constantly revise and complete their homework on time. 90% of these parents mentioned that their children are able to have a healthy communication with their teacher through Flipped Learning.

On the other hand, according to the parents from Non-Flipped Classroom (Group A), which similar to the traditional model of instruction, less than half of students revise and complete their homework on time. Only 23% of the parents feel that their children are happy and motivated in their learning. Majority of them feel that healthy communication between students and teachers do not exist in the Non-Flipped Classroom. From the comparisons, it is realized that even though there is no significant difference on the ability to cope with school syllabus among the Flipped Classroom and Non-Flipped Classroom, the attitude and behaviours towards learning among students from these two groups has significant differences.

Besides, all the parents from the Flipped Classroom parents voted that they are constantly being updated with their children’s learning progress through the online learning platform – Edmodo. That allows the parents to engage actively in school events and keep close relationship with the teachers in school (90%). In contrary, in the traditional learning methodology (Non-Flipped Classroom), only 13% of the parents expressed that they are being updated with their children’s progress and that caused only minority of these parents engage actively in school events. As such we see that the parents from Flipped Classroom group are more actively engaged with their children’s learning comparing to the Non-Flipped Classroom group, where the teaching-

learning process is more to the teachers and students' matter. Students from the Flipped Classroom group are more passionate and actively learn compare to the other group of students.

Author also studied on parents and students' attitudes towards their Flipped Learning experiences. 83% of parents and students from the Flipped Classroom agree that the online learning platform, Edmodo is user-friendly and a great tool to enhance teaching-learning experience. Majority of them support that Flipped Classroom is more effective learning experience comparing to the traditional method of learning. More than 90% of the Flipped Classroom students stressed that Flipped Classroom is student-centred learning, which allows the students to lead the discussion and able to work one-on-one with their instructor at their own pace. It cultivates positive learning attitudes and they become more active and independent learners through this new methodology. Students claimed that they gain more benefits from Flipped Classroom as they engaged actively in problem solving and critical thinking that reach beyond the traditional scope of course. These statements are also supported by majority parents. Almost all the students and majority parents wish to have more Flipped Classroom experiences in the future.

Conclusion

Most of us associate learning with formal education at school, college, and university. Generally, we are infused with the mindset that we should 'get a good education' as formal education and the resulting qualifications are important. It is true that education may capitalise our potential for better, more satisfying jobs, earn more, and perhaps, become more successful in our future. For the first twenty over years of our lives, our main responsibility is 'learning', spending in the classrooms acquiring new knowledge. 'Schooling', which is frequently linked to the 'teachers teach, and children learn' often work in a passive manner. The believe system is, children learn well when the teachers teach well; children do not learn much if the teachers fail to deliver the knowledge well to them. The misconception has placed the learning responsibility to teachers.

Instead, school and teacher should not be the exclusive provider of learning. There are many opportunities to enhance our knowledge and most importantly to develop the life-skills that are needed throughout life, not limited to the schooling years in formal educational institution. The teachers today may not be the best knowledge providers and skills trainers for their students. Hence, the teaching role of teachers must be readjusted. Students learn more in fact when they participate in the process of learning, whether it is through discussion, practice, review, or application (Junith, Barbara J. Millis, & Margaret).

It is important for our young learners to realise the importance of being active and independent learners, that possess positive attitude to learning both for personal and professional development. As such, the focus shall be on how to promote these students to take charge of their own learnings. This is in stark contrast to the traditional model of instruction, where the students are expected to sit for hours, listening and, theoretically, absorbing information presented by the teachers.

Besides promoting the active and independent learning, Peck and Dorricott (1997) in their article 'Realising the Promise of Technology?' in Educational Leadership stated that graduating students must be globally aware and able to use resources that exist outside the school. Hereby, Flipped Classroom which incorporate web resources in learning is seen as the best solution to meet the objectives above. Students who are in Flipped Classroom tend to be

active and independent learners and able to critically and creatively apply learning into real life application.

By encouraging short partner discussions during in-class sessions, adding problem-based or case-based research projects to the curriculum, and incorporating time for small-group critical analysis exercises are great active learning strategies that make our learners take charge and responsibility of their learning. Technology-enabled of Flipped Learning is going to be the future of classroom instruction. Technology integration in team-based or project-based curriculums enable students to be intellectually challenged, at the same time providing them realistic snapshot of what the modern workplace looks like. In this project, the author incorporates web resources such as YouTube, online articles, and the online learning platform – Edmodo in promoting Flipped Classroom to the young learner. This new learning experience create a positive and healthy learning environment, which engage teacher, students and parents in the learning process. Constant updates through Edmodo allow parents active participation and 24/7 access to their children’s learning, indirectly strengthening parent-child relationship. Flipped Classroom methodology allow students to do pre-class reading and preparation before attending the formal in-class sessions. In-class time allowance enables teacher to create platform for in-depth discussion and collaborative learning.

Flipped Classroom is an effective and efficient student-centred learning method. Its benefits are not limited to a particular subject or topic, but it nurtures the students to be independent and active learners who will be responsible for their own learning. Students in the Flipped Classroom will portray long-term interest in learning and apply the knowledge in real-life situation. It is a skill of learning, which applies not only to science, but across all subjects. It is the future of learning, supplementing traditional out-of-class work with project-based and team-based learning. When students are invited to actively participate in the learning environment, they take more responsibility for their performance in the study. Similarly, when they are given opportunity to decide on what they learn and how they use that knowledge, students see the knowledge as more valuable and more directly related to their goal.

However, it is important to realise that it is an easy model to get wrong and need careful preparation. This self-pace learning relies heavily on the principle that students are self-motivated and committed to their own learning. This may not be suitable for those who are less motivated and discipline. Besides, the necessity for students to have access to smart gadgets like laptop, smartphones, tablets, and internet to view their lectures is one of the most prominent issues. This is especially challenging for students from low-income districts and rural areas which has limited access to resources.

It is important to note that this proposal was implemented only with 60 students and 60 parents who are from middle and upper classes families in Setia Alam, a modern township in an urban area. All these students are also of above average of English Language mastery and have experiences in using the smart gadgets and browsing internet. Thus, they did not face much challenges when dealing with the online learning instructions and accessing web resources. Besides, the teacher or instructor in this study understand very well the principles of Flipped Classroom and is the subject master who know the topic and syllabus very well. As such, the results produced may not represent the general population.

The results of Flipped Classroom are encouraging, but flipping the classroom is not easy. As this is new to many parents and students, the teachers who wish to promote Flipped Classroom need to put a lot of effort in tracking them to the correct mindset of learning and educating

them the principles of Flipped Learning. Many may still expect to be lectured and resist to changes. Challenges are expected in introducing and implementing the Flipped Classroom, however the significant effects and benefits observed from the study set as positive points to encourage us as educators to promote this new methodology in school.

Some adjustments and improvements are needed in the future project of Flipped Classroom in order to smoothen the process of teaching-learning and maximise the advantages from Flipped Learning to the primary school children. More efforts should be given to create awareness among the educators, parents and children about the importance of active learning and independent learning. It is important for us to resolve their misconceptions about learning and accept the changes of teacher and student's roles in learning and the new model of instruction. Conducting Flipped Classroom in long term and more subjects is essential to instil and strengthen the positive learning habits among these young learners.

Students are learning much content and build stronger skills, which are not so easily measured, but their enthusiasm for the learning and active engagement of home-school partnerships making the Flipped Classroom a well-worth effort to be made. Because students of Flipped Classroom are responsible for preparing for the lessons on their own, they indirectly learn how to extract information from a textbook, online resources or a video. These self-regulated learning skills are important for their life-long learning and progress in life. Teachers have more than enough time to adequately explore all the concepts that students need in class together, rather than sending them off on their own. The significant results in Flipped Classroom can be a booster of more STEM schools in Malaysia; and a motivation for instructors to engage technology in teaching-learning processes.

It is important for educators today to analyse the root and purpose of education, especially when deal with the young learners. Which should be our aim? To teach the students well? Or to mentor the students to learn well? Educators must realise that learners are in fact unique. There is no one system to fit all. Multi-sensory resources and student-centred learning are important elements to aid each learner to maximise their full potential. Besides, home-school partnership is important to accelerate the learning outcomes and build the learners in a well-balance and holistically. It is recommended that curriculums designed should allow these learners to be active participants, draw on their own experience, and skill development. As educator: we love, we care, we educate.

References

- Crisan, G. & Albulescu, I. (2017). From STEM to STEAM through flipped classroom. Imitation as a semantic mark. *International Conference On Virtual learning iCVL 2017*. Retrieved from https://www.researchgate.net/publication/320106764_From_STEM_to_STEAM_through_flipped_classroom_Imitation_as_a_semantic_mark
- Doyle, M.B. and Bozzone, D. . (2018, Winter). IMPACT. *The Journal of the Center for the Interdisciplinary Teaching and Learning*, 7(1). Retrieved from sites.bu.edu/impact/files/2018/01/WINTER-2018-IMPACT.pdf
- FLIP Learning. (2015, October 18). *Exploring the Bergmann & Sams School of Flipped Learning*. Retrieved from <http://www.flippedclassroomworkshop.com/bergmann-and-sams-school-of-flipped-teaching-learning/>
- Hamisah, T., Siti & Puteh, Marlia. (2018). *Framing Malaysian Higher Education 4.0: Future-proof Talents*. Ministry of Higher Education Malaysia (MyHE). Retrieved from

- https://www.researchgate.net/publication/324491091_FRAMING_MALAYSIAN_HIGHER_EDUCATION_40_FUTURE-PROOF_TALENTS
- Imenda, S. (2014). Is There a Conceptual Difference Between Theoretical and Conceptual Frameworks. *Journal of Social Sciences*, 185-195. Retrieved from https://academicguides.waldenu.edu/ld.php?content_id=41503706
- Jennifer A, W. M. (2016, June). Using Mixed Methods to Develop a Measure of Math and Science Engagement. *Learning and Instruction*, 43, 5-15. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0959475216300093?via%3Dihub>
- Junith, O. G., Barbara J. Millis, & Margaret, C. W. (n.d.). *The Course Syllabus: A Learning-Centered Approach*. Wiley Publisher.
- Knewton. (2018). *Knewton Infographics*. Retrieved from Flipped Classroom: <https://www.knewton.com/infographics/flipped-classroom/>
- McKinsey Global Institute. (2017). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*. McKinsey & Company. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Executive-summary-December-6-2017.ashx>
- McKinsey Global Institute. (2017). *Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation*. McKinsey & Company. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Executive-summary-December-6-2017.ashx>
- Mustafa, Z. (2018). *Way Forward for Higher Education in 4IR Era*. New Straits Times.
- National Science Foundation. (2013). *Inspiring STEM Learning*. Retrieved from https://www.nsf.gov/about/congress/reports/ehr_research.pdf
- Paul, A. (2014). *In Pursuit of Better Student Engagement in Class From the Perspective of Gen Y Undergraduates: A Case in Management Education*. . Global Summit on Education.
- Rahman, S. K. (2018). *Science Outlook 2017*.
- Rahman, S. K. (2018). *Science Outlook 2017*. Academy of Sciences Malaysia. Retrieved from https://www.researchgate.net/publication/327201814_Science_Outlook_2017
- Roberts, T. (2004). *Online Collaborative Learning: Theory and Practice*. Information Science Publishing. Retrieved from <https://epdf.tips/queue/online-collaborative-learning-theory-and-practice.html>
- Strayer, J. (2007). The Effects of the Classroom Flip on the Learning Environment. Retrieved from faculty.washington.edu/rvanderp/DLData/FlippingClassDis.pdf
- Szparagowski. (2014). The Effectiveness of the Flipped Classroom" (2014). Honors Projects. Retrieved from <https://scholarworks.bgsu.edu/honorsprojects/127>
- Szparagowski, R. (2014). The Effectiveness of the Flipped Classroom. Retrieved from <https://scholarworks.bgsu.edu/hoborsprojects/127>
- Tucker, B. (2012). Online instruction at home frees class time for learning. *The Flipped Classroom, Education Next*, 12(1). Retrieved from <https://www.educationnext.org/the-flipped-classroom/>
- U.S. Bureau of Labor Statistics. (2017). *STEM Occupations: Past, Present, And Future*. Retrieved from <https://www.bls.gov/spotlight/2017/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future/pdf/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future.pdf>
- Victoria State Government. (2018, June 12). *Principles of Learning and Teaching (PoLT)*. Retrieved from Victoria State Government - Education and Training:

<http://www.education.vic.gov.au/school/teachers/teachingresources/practice/improve/Pages/principlespolt.aspx>

Wisniewski, M. (2010). Leadership and the Millennials: Transforming Today's Technological Teens into Tomorrow's Leaders. *Journal of Leadership Education*, 9(1), 53-67.

Worland, J. (2015, August 12). Kids Receive 3 Times the Recommended Homework Load, Study Says. p. TIME . Retrieved from <http://time.com/3994039/recommended-homework-load-stress/>